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AUVERGNE CLERMONT 1 UNIVERSITY

FACULTY OF MEDICINE

THESIS

For the

DOCTORATE IN MEDICINE
(State Doctorate)

By

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**OCULAR BURNS DUE TO BASES :
Comparison of human and experimental clinical data
concerning the intra ocular penetration of ammonia.
Is there a delay for the external ocular rinsing
in case of serious ocular burns due to bases?**

President : Mr P. SOLE, Professor

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Mr DOLY, Professor
Mr N. SCHRAGE, Professor
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CONCLUSIONS

Ocular burns due to bases, and especially ammonia are still a serious pathology. They concern the visual prognosis of patients that are often young. The socio economical consequences are important.

Our clinical prospective brings new epidemiological data. In Martinique, ocular burns due to ammonia following an aggression related to an adultery are preponderant compared to accidental burns. These burns are related to local believes.

We have established a good predictibility of the Ropper-Hall classification based on the data from the initial clinical examination.

The average healing time for an ocular burn due to a base, classified as minor in this classification, is 12 days in our study. This determines the prescription length of the treatment and the length of the work loss.

We gathered human clinical arguments on the interest of high doses of vitamin C in the treatment of ocular burns due to bases. But we specially showed the importance of the external ocular rinsing. Indeed, our clinical prospective study allowed us to relate the seriousness of ammonia ocular burns to an external ocular rinsing delayed of more than 30 minutes.

Our experimental study confirms the rapidity of penetration of ammonia in the eye (1 to 3 minutes).

It shows the return to a physiological pH 30 minutes after the burn, which makes the efficacy of a rinsing illusory after this delay. This undoubtedly explains the delay found in the human clinical study.

It shows the better efficacy of an external ocular rinsing with Diphotérine[®], compared to a rinsing with physiological serum, during the 10 first minutes after the ammonia burn. This efficacy is established on biochemical (pH evolution) and histological (the rinsing with physiological serum induces a serious stromal oedema deleterious for the corneal healing) arguments.

It shows for the first time the possibility to measure in vivo the density of proteins consumed by a base that has penetrated into the aqueous humour. This possibility opens very interesting research ways. If this study can be reconducted for other bases with different pK, it would then be possible to correlate the pK of a base and the density of proteins consumed in the eye, in other words to evaluate the potential danger of a base for the human tissues.